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09/872,970	06/01/2001	James M. Reuter	P01-3667	3048

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EXAMINER

CHANKONG, DOHM

ART UNIT PAPER NUMBER

2152

DATE MAILED: 10/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding..

Office Action Summary

Application No.

09/872,970

Applicant(s)

REUTER ET AL.

Examiner

Dohm Chankong

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30, 34 and 36-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-30, 34 and 36-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

1> This action is in response to Applicant's remarks. Claims 31-33 and 35 have been cancelled. Claims 1-30, 34 and 36-40 are presented for further examination.

2> This is a final rejection.

Response to Arguments

3> Applicant's arguments with respect to claims 1-23, and 36-40 have been considered but are not persuasive.

Applicant traverses the rejections of claims 1-40 under Blumenau, in view of Casorso. In the remarks, Applicant only addresses claims 1-11; in particular arguing that Blumenau fails to disclose the limitation of the controller intermittently replacing contents of the first table in the agent. As claim 12 was amended to substantially along the lines of the limitations of claim 1, Examiner will assume that Applicant's remarks for claim 1 are asserted for claim 12 and its depending claims as well.

However, Applicant is silent as to why he traverses rejections for claims 24-30 and 34. These claims do not have the same limitation in dispute that was argued by Applicant for independent claims 1 and 12. As it is seems that Applicant has not responded to the rejection for claims 24-30 and 34 under Blumenau, in view of Casorso, Examiner is unable to respond to Applicant's traversal and maintains the rejections for these claims.

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4> Referring now to independent claims 1 and 12, Applicant is arguing in substance (a) that Examiner's construction of claim elements is flawed and (b), Blumenau does not disclose intermittently causing contents from one table to replace contents of another table.

In response to (a), Examiner has attempted to more clearly delineate the claim mapping between Blumenau and the claimed elements in the following rejections. In particular, Examiner interprets Blumenau's port adapter corresponding to claimed agent and his "storage volume" as a controller. Blumenau's port adapter stores a copy of mapping tables [Figures 23-30 | column 14 «lines 23-31» | column 26 «line 25» to column 27 «line 23»]. Connected to the port adapter is a storage volume that stores a second copy of said tables [column 14 «lines 31-33» | column 21 «lines 35-40»]. See rejection of claim 1.

In response to (b), Blumenau discloses that the purpose of the back-up table (stored in a storage volume) is to aid in port adaptor recovery and diagnostics [column 21 «lines 35-40»]. Blumenau fails to explicitly disclose that the back-up table intermittently causes contents of the first copy of the table to be replaced by contents of the second copy of the table, but such functionality is inherent based on the purpose of back-up tables. As is well known to one of ordinary skill in the art and further supported in Blumenau's disclosure, a back-up table would enable recovery if the primary table failed. In Blumenau, the back-up table would enable the mapping table in the port adaptor to be replenished with the back-up entries and data when the adaptor or table fails. Thus, the claimed functionality of intermittently replacing contents of a table is inherent based on the relationship of the Blumenau's port adaptor (agent) and his storage volume (controller), the storage volume storing the mapping tables and lists "as backup for port adapter error recovery".

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5> Rejections of dependant claims 2-11, 13-23 and 36-40 were not addressed by Applicant and therefore are not addressed here.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6> Claims 1-30, 34 and 36-40 are rejected under 35 U.S.C § 103(a) as being unpatentable over Blumenau et al, U.S Patent No. 6,260,120 ["Blumenau"] in view of Casorso et al, U.S Patent No. 5,404,361 ["Casorso"].

7> As to claim 1, Blumenau discloses a virtual storage system for linking a host to one or more storage devices over a network, the system comprising:

an agent connected to the host, the agent having volatile memory for storing a first copy of a table, the table having entries to map virtual addresses (ports) to locations on the storage devices [Figure 4 «item 35» | Figures 23-25, 30 | column 14 «lines 23-31» | column 25 «lines 50-56» where : Blumenau's port adapter 35 corresponds to claimed agent, the port adaptor relying on RAM to store information]; and

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a controller coupled to the agent, the controller having non-volatile memory for storing a second copy of the table [Figure 21 «item 27» | column 14 «lines 31-33» | column 21 «lines 35-40» | column 32 «lines 43-54» where : Blumenau discloses that a copy of table is placed in the storage volume, allowing for table recovery during port adaptor error recovery or diagnostics. The storage volume (controller) and the port adapter (agent) are two separate elements];

whereby during an I/O operation, the host accesses one of the entries in the table stored on the agent to determine one of the storage device locations [column 23 «lines 49-59» | column 25 «lines 50-58» | column 26 «lines 28-36» where : the “Report LUNs” command allows hosts to retrieve information from the mapping tables located at the port adaptor. Blumenau discloses a “volume access and mapping table”. Therefore the mapping table is accessed whenever a volume needs to be accessed].

8> Blumenau fails to expressly disclose that his storage volume (controller) coupled to port adaptor (agent) intermittently causes contents of the first copy of the table [at the host controller] to be replaced by contents of the second copy of the table [at the controller]. However it is clear from Blumenau's specification that the purpose of the storage volume back-up is enable recovery of table information when the port adaptor fails or during diagnostics. Conceivably, the concepts of a back-up table and recovery would lead one of ordinary skill in the art to reasonably infer that the purpose of Blumenau's back-up table is to replace the contents of the primary table located in the port adaptor whenever there is an error with the port adaptor or its table. Therefore, it is inherent in Blumenau's system that

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the back-up table located at the storage volume will intermittently replace contents of the first table located in the port adaptor during times of failure of error.

9> Further, Blumenau discloses mapping virtual ports (addresses) to physical locations on a drive but does not explicitly disclose mapping virtual disk positions on the storage device. In a same field of invention [Figure 1], is directed towards providing error check functionality to a dynamically mapped storage system. Additionally Casorso discloses a mapping table, the table having entries to map virtual disk positions to locations on the storage devices [column 1 «lines 37-42» | column 3 «lines 18-38» | column 6 «lines 60-66» | column 8 «lines 5-23»]. It would have been obvious to one of ordinary skill in the art to modified Blumenau's mapping table with the functionality of Casorso's mapping table to enable the mapping of the virtual disk positions to their counterparts on the physical drive. The benefits of such a mapping are well known in the art such as providing a level of abstraction to the a host processor for accessing the storage system [see Casorso column 3 «lines 34-37»].

10> As per claims 2 and 3, Blumenau teaches the table entries further include an indication whether a private state is activated such that the private state for a table entry becomes activated when that table entry contains no shareable mapping information. Data in the particular storage location is restricted from shared, read/write access (fig.8). Blumenau does not explicitly teach invalid state. However, it would have been obvious to one of ordinary skill in the art to modify the teachings of Blumenau to restrict access to a particular

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portion of the storage location by making the entry state invalid. One of ordinary skill in the art would have been motivated to add this function to restrict unauthorized access to private data that the user do not want others to see or share.

11> As per claims 4-5, Blumenau teaches the table entries further include an indication of whether a no-write state is activated such that the no-write state for one of the entries becomes activated when data cannot be written to the storage location contained in that entry (col. 19, lines 15-21).

12> As per claims 6-7, Blumenau teaches the communication channel [Figure 1 «item 33» : connecting the port adaptor to the storage volumes] to couple the agent and the controller, wherein communication channel employs a data transfer protocol to transport messages on the communication channel (col. 2, lines 19-22).

13> As per claims 8-11, Blumenau teaches the entries include an offset, wherein the offset includes logic unit number identifier (fig. 25, col. 27, Lines 23-24., virtual disk mapping table) and a block identifier (fig. 34), and the entries further includes a segment of virtual disk positions (fig. 8).

14> Claims 12-21 are rejected for similar reasons as claims 1-5 and 8-11. Blumenau further teaches the data frame (block) is about 1 MB (fig. 34). Furthermore, the designation of the size of the data block is merely a design choice. It is well known in the art to assign the

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data block to any arbitrary size and does not provide any patentable distinction over the prior art.

Blumenau also teaches a plurality of variables such as private/share (fig. 8) and write/no-write Boolean states of the entry (col. 19, Lines 15-21).

15> As per claims 22-23, Blumenau teaches the states include a zero state (col. 22, lines 10-12, null state initially has a zero or null value) and an error state (col. 12, line 20).

16> As per claims 24-25, Blumenau teaches a method for accessing the logical volume on a virtual disk (26, fig. 1) by the host controller (61, fig. 4., host controller is functionally equivalent to agent) coupled to the host (20, fig. 1) within a network (21, fig. 1), comprising: specifying a block (logical unit number or LUN) on the virtual disk (through virtual port - volume 1) within the operation, accessing a table mapping (Figures 23-25) the virtual address to a storage location on a storage device, issuing a corresponding operation to the storage device (part of storage subsystem) (column 8, lines 48-65 where : the operation is a read operation of the storage device), wherein the corresponding operation correlates to the operation on the virtual address (column 25 «lines 50-58» | column 26 «lines 28-36»); completing the corresponding operation', and presenting the completed corresponding operation to the virtual address (column 8 «lines 48-65», column 33 «lines 1-23 and 42-60»).

Blumenau discloses mapping virtual ports (addresses) to physical locations on a drive but does not explicitly disclose mapping virtual disk positions on the storage device.

17> In a same field of invention [Figure 1], Casorso is directed towards providing error check functionality to a dynamically mapped storage system. Additionally Casorso discloses a mapping table, the table having entries to map virtual disk positions to locations on the storage devices [column 1 «lines 37-42» | column 3 «lines 18-38» | column 6 «lines 60-66» | column 8 «lines 5-23»]. It would have been obvious to one of ordinary skill in the art to modified Blumenau's mapping table with the functionality of Casorso's mapping table to enable the mapping of the virtual disk positions to their counterparts on the physical drive. The benefits of such a mapping are well known in the art such as providing a level of abstraction to the a host processor for accessing the storage system [see column 3 «lines 34-37»].

18> As per claims 26-27, Blumenau teaches updating the table with a persistently-stored table residing in a non-volatile memory (88, fig. 7, col. 16, Lines 27-30) and determining states of the table (fig. 8., storage controller can restrict or permit volume access by host controller by setting the flag to either private or share Boolean states).

19> As per claim 28, Blumenau teaches sending a fault message when the table is unable to be accessed (187, fig. 17).

20> Claim 29 is rejected based on similar reasons as claim 1 addressed above.

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21> As per claim 30, Blumenau teaches the storage controller sends updated information of the entries in the mapping table to host controller (agent) (col. 22, Lines 44-47., col. 24, Lines 64 - col. 25, lines 7).

22> Claims 34 are rejected for similar reasons as claims 24 and 31 addressed above.

23> As per claims 36-38, Blumenau teaches the volume access mapping table has the flexibility in assigning a variable number of volumes to each group of blocks of contiguous memory locations (fig. 5, col. 15, Lines 42-48).

24> As per claims 39-40, Blumenau teaches the table entry comprises a beginning and ending data frames (blocks) (fig. 34).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the

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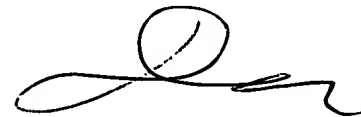
advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dohm Chankong whose telephone number is (571)272-3942. The examiner can normally be reached on 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenton Burgess can be reached on (571)272-3949. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DC



Dung C. Dinh
Primary Examiner